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Date: February 27, 2003

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PATENT
36856.920

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Yoshiaki KOHNO et al.

Serial No.: 09/670,150

Filed: September 26, 2000

Title: SENSOR ARRAY, METHOD FOR
MANUFACTURING SENSOR ARRAY,
AND ULTRASONIC DIAGNOSTIC
APPARATUS USING THE SAME

Art Unit: 2834

Examiner: T. Dougherty

REQUEST FOR RECONSIDERATION

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Office Action dated September 4, 2002, the period for response to which has been extended to March 4, 2003, by the accompanying Petition for Three-Month Extension of Time, please reconsider the above-identified application in view of the following remarks.

Claims 1-3 are pending in this application.

The drawings were objected to because the figures include Japanese characters. Applicants enclose herewith formal drawings in which the Japanese characters have been removed. Accordingly, Applicants respectfully request reconsideration and withdrawal of this objection, and entry of the formal drawings.

Claims 1-3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hanafy (U.S. 5,945,770), Smith (U.S. 5,548,564 or 5,744,898), Smith (U.S. 5,329,496)

Lindemann et al. (U.S. 6,066,911) or Obara et al. (JP 57-193199) in view of Unami (U.S. 5,925,971).

Claim 1 recites:

"A sensor array comprising:
a substrate; and
a plurality of piezoelectric oscillators fixed on a main surface of the substrate in a matrix form, the main surface of the substrate extending in a plane defined by transverse x and y directions, each of the piezoelectric oscillators comprising:
a plurality of piezoelectric layers which extend in a z-direction transverse to the plane defined by the x and y directions and which are laminated in the x or y direction of the main surface of the substrate;
inner electrodes disposed between the plurality of piezoelectric layers; and
outer electrodes formed on end faces of the plurality of layers."
(Emphasis added)

The Examiner acknowledged that Hanafy, the three Smith references, Lindemann et al. and Obara et al. fail to teach or suggest "a plurality of piezoelectric layers which extend in a z-direction transverse to the plane defined by the x and y directions and which are laminated in the x or y direction of the main surface of the substrate." However, the Examiner alleged that Unami teaches a piezoelectric resonator comprising a plurality of piezoelectric layers 10a-10d which extend in a z-direction transverse to the plane defined by the x and y directions and which are laminated in the x or y direction of the main surface of the substrate. Thus, the Examiner concluded that it would have been obvious to employ piezoelectric oscillators extending in a z-direction transverse to the plane defined by the x and y directions as taught by Unami in the device of Hanafy, the three Smith references, Lindemann et al. and Obara et al. "since this is a construction in which the piezoelectric resonators are easy to mount on the circuit board." Applicants respectfully disagree.

The piezoelectric resonator of Unami clearly **cannot** be combined with the devices of Hanafy, the three Smith references, Lindemann et al. and Obara et al. because of the clear differences in structure between Unami and the primary references (Hanafy, the three Smith references, Lindemann et al. and Obara et al.). Particularly,

the arrangement of the piezoelectric layers Unami is specifically for a resonator, which is very different from the structure, arrangement and function of a sensor array. The structure, arrangement and function of the resonator of Unami and its piezoelectric layers are clearly **NOT** suitable for use in any of the sensor arrays of Hanafy, the three Smith references, Lindemann et al. and Obara et al. because the resonator of Unami has a totally different arrangement of the piezoelectric layers resulting in a totally different operation and function.

More specifically, as recognized by the Examiner, the piezoelectric layers of Unami extend in a z-direction transverse to the plane defined by the x and y directions and are laminated in the x or y direction of the main surface of the substrate. In complete contrast to this arrangement of Unami, the piezoelectric layers of the devices of Hanafy, the three Smith references, Lindemann et al. and Obara et al. extend in the x or y direction (which is totally different from the z direction arrangement of Unami) transverse to the plane defined by the x and y directions and are laminated in the z direction (which is totally different from the x or y direction of lamination of Unami). Given the completely different arrangement, orientation and resulting operation, it is absolutely impossible for the structure of Unami to be combined with the devices of Hanafy, the three Smith references, Lindemann et al. and Obara et al.

Furthermore, the structure of Unami is specifically disclosed as having a rectangular parallelepiped shape, which cannot be arranged in a sensor array such that a plurality of piezoelectric oscillators are fixed on a main surface of the substrate in a matrix form. Thus, for this additional reason, the structure of Unami to be combined with the devices of Hanafy, the three Smith references, Lindemann et al. and Obara et al.

Since the structure of the resonator of Unami is clearly cannot be used or incorporated in any of the sensor arrays of Hanafy, the three Smith references, Lindemann et al. and Obara et al., Applicants respectfully submit that the resonator of Unami cannot be properly combined with Hanafy, the three Smith references, Lindemann et al. and Obara et al. It is impermissible within the framework of § 103 to pick and choose from any one reference only so much of it as will support a given

position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. In re Wesslau, 353 F.2d 238, 241, 147 USPQ 391 (CCPA 1965).

In addition, there would have clearly been no motivation to employ the piezoelectric resonator of Unami in any of the devices of Hanafy, the three Smith references, Lindemann et al. and Obara et al., because Unami is directed to an entirely different type of electronic device having a totally different structure, arrangement and operation from the devices of Hanafy, the three Smith references, Lindemann et al. and Obara et al. Particularly, Unami is directed to a piezoelectric resonator used in a ladder filter, an oscillator, a discriminator or a filter (see col. 1, lines 7-14). Unami et al. fails to teach or suggest that the resonator disclosed therein could or should be used in a sensor array. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. In re Geiger, 815 F.2d 686, 2 USPQ 1276, 1278 (Fed. Cir. 1987). The Examiner has failed to establish a *prima facie* case of obviousness since the references offer no suggestion of the claimed combination. See In re Nielson, 816 F.2d 1567, 2 USPQ 2d 1525, 1528 (Fed. Cir. 1987). Nor could the prior art provide such a suggestion since it is a physical impossibility for the structure and arrangement of Unami to be used with the devices of the primary references.

Instead of basing the conclusion of obviousness on actual teachings or suggestions of the prior art and the knowledge of one of ordinary skill in the art at the time the invention was made, the Examiner has improperly used Applicants' own invention as a guide. It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. In re Fritch, 972 F.2d 1260, 23 USPQ 2d 1780, 1784 (Fed. Cir. 1992).

Even using improper hindsight reconstruction, Unami clearly can **NOT** be combined with any of Hanafy, the three Smith references, Lindemann et al. and Obara

et al. for the reasons described above.

The fact that the structure and arrangement of Unami cannot be combined with the devices of the primary references is clearly established by the primary references themselves. All of the sensor arrays of Hanafy, the three Smith references, Lindemann et al. and Obara et al. specifically teach the conventional arrangement for sensor arrays in which a plurality of piezoelectric layers extend in the **x-direction or the y-direction** defining the plane of the main surface of the substrate and which are laminated in the **z-direction transverse to the plane defined by the x and y directions** of the main surface of the substrate.

This clearly indicates that the present claimed invention including "a plurality of piezoelectric layers which extend in a **z-direction transverse to the plane defined by the x and y directions** and which are laminated in the **x or y direction** of the main surface of the substrate" was not viewed as technically feasible, and that the unique combination and arrangement of elements recited in the present claimed invention had not been previously contemplated. Evidence that the combination was not viewed as technically feasible must be considered, for conventional wisdom that a combination should not be made is evidence of unobviousness. See Arkie Lures, Inc. v. Gene Larew Tackle, Inc., 119 F.3d 953, 43 USPQ 2d 1294 (Fed. Cir. 1997).

Thus, it would **not** have been obvious to employ the piezoelectric resonators of Unami, which are structurally incompatible with the sensor array devices of Hanafy, the three Smith references, Lindemann et al. and Obara et al., in the devices of Hanafy, the three Smith references, Lindemann et al. and Obara et al.

Regarding claim 2, the Examiner alleged that "the forming method is not germane to the issue of patentability of the device itself. Therefore, this limitation (that of claim 2) has not been given patentable weight." This is clearly incorrect.

Claim 2 recites "a method for manufacturing the sensor array according to Claim 1, comprising the steps of:..." Thus, claim 2 is clearly a method claim which merely uses shorthand notation to describe the type of sensor array which is manufactured. Thus, contrary to the Examiner's allegation, claim 2 is **NOT** directed to a device, but rather is specifically recites a method. Thus, Applicants respectfully submit that the

method steps recited in method claim 2 **must** be given patentable weight.

MPEP 2173.05(f) indicates that a reference to a preceding claim to define a limitation is an acceptable claim constructions. In Ex parte Porter, 25 USPQ2d 1144 (BPAI 1992), the Board held that a reference to "the nozzle of claim 7" in a method claim was held to comply with 35 U.S.C. § 112, second paragraph. Thus, Applicants respectfully submit that claim 2 is directed to "a method" and **not** to a device, that the claim construction is acceptable under 35 U.S.C. § 112, second paragraph, and that the method steps recited in claim 2 must be given patentable weight.

Hanafy, the three Smith references, Lindemann et al., Obara et al. and Unami clearly fail to teach or suggest the method steps recited in claim 2.

Accordingly, Applicants respectfully submit that Hanafy, the three Smith references, Lindemann et al., Obara et al. and Unami, applied individually or in combination, fail to teach or suggest the unique combination and arrangement of element recited in claims 1 and 2.

In view of the foregoing, Applicants respectfully submit that claim 1 and 2 are allowable. Claim 3 is dependent upon claim 1, and is therefore allowable for at least the reasons that claim 1 is allowable.

In view of the foregoing Amendments and Remarks, Applicants respectfully submit that this Application is in condition for allowance. Favorable consideration and prompt allowance are respectfully solicited.

To the extent necessary, Applicants petition the Commissioner for a Three-month extension of time, extending to March 4, 2003, the period for response to the Office Action dated September 4, 2002.

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The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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